

Patent Application of Robert D. Gourlay
for "Inhalation Detector" continued

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CLAIMS

What is claimed is:

1. A detector providing an electrical signal in response to a predetermined pressure difference comprised of:
 - a. a diaphragm responsive to said predetermined pressure difference and a pair of electrodes, fixed in planar form, cooperating with and facing said diaphragm;
 - b. an insulator sandwiched between and contiguous with said diaphragm and said electrodes;
 - c. a conversion and amplifying means generating a feedback voltage responsive to a capacitance between said electrodes;
 - d. a feedback means applying said feedback voltage across said diaphragm and said electrodes whereby electrostatic forces upon said diaphragm maintain said capacitance substantially constant;
 - e. a comparator means providing an electrical output signal when said feedback voltage exceeds a predetermined value.
2. The apparatus of claim 1 wherein a filter means modifies the response of said comparator means to reject offset error and gradual deviations of said feedback voltage.
3. The apparatus of claim 1 wherein said conversion and amplifying means includes an oscillator having a frequency responsive to said capacitance and a monostable multivibrator responsive to said oscillator.

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4. The apparatus of claim 3 wherein an integrator averages the waveform from said monostable multivibrator to provide said feedback voltage.
5. The apparatus of claim 4 wherein a secondary feedback means controls said integrator during reversed pressure conditions.
6. The apparatus of claim 1 wherein said diaphragm is secured in place by a means selected from the group consisting of adhesive bonding and welding and clamping.
7. The apparatus of claim 1 wherein said insulator is an insulating coating disposed upon and bonded to said electrodes.
8. The apparatus of claim 1 wherein said insulator is integral with said diaphragm.
9. The apparatus of claim 1 wherein said diaphragm is comprised of a plastic film with a metal coating on one face.
10. The apparatus of claim 1 wherein the active electronic devices implementing said conversion and amplifying means, said feedback means, and said comparator means are selected from the group consisting of transistors and digital microcircuits and linear microcircuits and mixed function microcircuits.